explanation that shows them to be an artifact. On the other hand, if the results are what you would expect given an existing model of the phenomena, or you are able to advance such a model in which they make sense, that increases the likelihood that you will accept the results as evidence.

This yields the third criterion: coherence with plausible accounts of the phenomena. Relying on it seems paradoxical if you see evidence as foundational, such that models or other accounts are assessed in terms of the evidence offered for them. For what I have just proposed is that evidence is assessed by its fit to an account; specifically, it is more likely to be accepted when it fits with a plausible account than when it does not. As paradoxical as it seems, however, in practice scientists often rely on this criterion. Some may worry that if this is actually how scientists appraise evidence, they are guilty of circular reasoning. However, such reasoning would be viciously circular only if the sole basis for evaluating the account were the results of experimental techniques, which were themselves being evaluated by whether they supported the account. But that is not the only way in which an account can be evaluated; another is whether it coheres with other accounts. As we shall see, the new research instruments and techniques that were crucial for the development of cell biology often suggested the existence of new cell organelles. But did these organelles really exist? When the new organelles were identified as having a role in the emerging mechanistic model of cell function, then researchers were more likely to accept not only the existence of the organelles but also the instruments and techniques that pointed to their existence. When no role for the putative organelle was apparent, the existence of the organelle and the techniques providing evidence for them were subject to question.

I have proposed three criteria by which one might assess a new research instrument or technique merely by the results it generates: the degree to which

- the results exhibit a determinate structure or pattern and are repeatable;
- the results agree with results generated by other techniques or can be calibrated against them; and
- the putative evidence coheres with theoretical accounts that are taken to be plausible.

In practice, each of these three criteria plays an important role in scientists' evaluation of evidence (Bechtel, 1995; Bechtel, 2000; see also Creath, 1988). Having offered this rather abstract sketch of the epistemic problems encountered by scientists when introducing new instruments and techniques and answering the inevitable charges of artifact, I turn now to concrete exemplars from the early years of modern cell biology. Most prominent were two